

# Solutions: Examining Distributions

## Checkpoint 2

### Question 1

Students will see one of the following two questions, chosen at random.

Option 1:

The distribution of the amount of money spent by students for textbooks in a semester is approximately normal in shape with a mean of \$235 and a standard deviation of \$20. According to the standard deviation rule, almost 2.5% of the students spent more than \_\_\_\_\_ on textbooks in a semester.

- (a) \$195
- (b) \$215
- (c) \$235
- (d) \$275
- (e) \$295

Correct answer: (d)

Option 2:

The distribution of the amount of money spent by students for textbooks in a semester is approximately normal in shape with a mean of \$235 and a standard deviation of \$20. According to the standard deviation rule, almost all (99.7%) of the students spent on textbooks in a semester:

- (a) between 215 and 255 dollars.
- (b) between 195 and 275 dollars.
- (c) between 175 and 295 dollars.
- (d) less than 215 dollars or more than 255 dollars.
- (e) above 235 dollars.

Correct answer: (c)

Select one answer.  
10 points

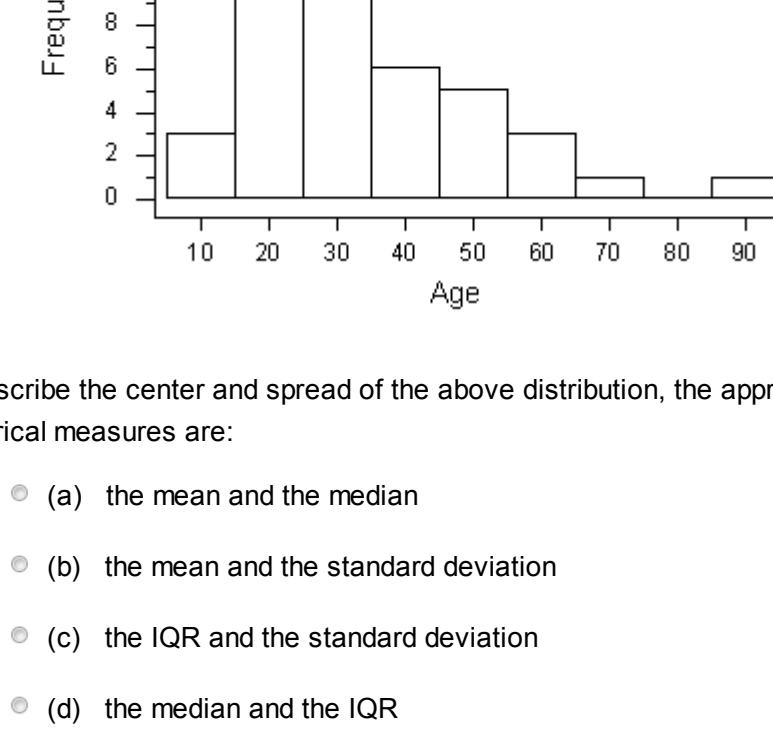
Select one answer.  
10 points

### Question 2

Students will see one of the following two questions, chosen at random.

Option 1:

The histogram below shows the times, in minutes, required for 25 rats in a animal behavior experiment to successfully navigate a maze.



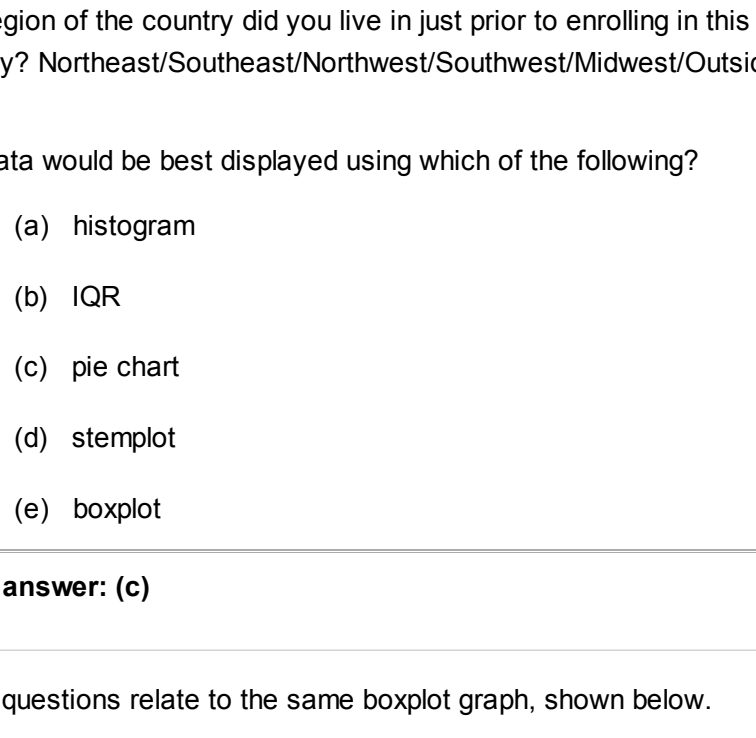
To describe the center and spread of the above distribution, the appropriate numerical measures are:

- (a) the mean and the median
- (b) the mean and the standard deviation
- (c) the IQR and the standard deviation
- (d) the median and the IQR
- (e) Any of the above would be appropriate, it is just a matter of taste.

Correct answer: (d)

Option 2:

The histogram below displays the distribution of 50 ages at death due to trauma (unnatural accidents and homicides) that were observed in a certain hospital during a week.



To describe the center and spread of the above distribution, the appropriate numerical measures are:

- (a) the mean and the median
- (b) the mean and the standard deviation
- (c) the IQR and the standard deviation
- (d) the median and the IQR
- (e) Any of the above would be appropriate, it is just a matter of taste.

Correct answer: (d)

Select one answer.  
10 points

Select one answer.  
10 points

### Question 3

Students will see one of the following two questions, chosen at random.

Option 1:

A student survey was conducted in a major university, where data were collected from a random sample of 750 undergraduate students. One variable that was recorded for each student was the student's answer to the question: "With whom do you find it easiest to make friends? Opposite sex/same sex/no difference."

These data would be best displayed using which of the following?

- (a) pie chart
- (b) histogram
- (c) IQR
- (d) stemplot
- (e) boxplot

Correct answer: (a)

Option 2:

A student survey was conducted in a major university, where data were collected from a random sample of 750 undergraduate students. One variable that was recorded for each student was the student's answer to the question: "What region of the country did you live in just prior to enrolling in this university? Northeast/Southeast/Northwest/Southwest/Midwest/Outside the U.S."

These data would be best displayed using which of the following?

- (a) histogram
- (b) IQR
- (c) pie chart
- (d) stemplot
- (e) boxplot

Correct answer: (c)

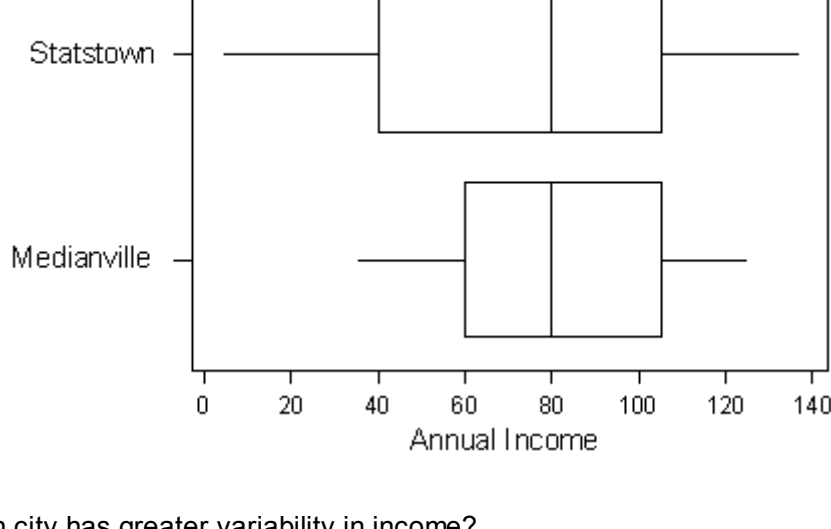
The next 4 questions relate to the same boxplot graph, shown below.

### Question 4

Students will see one of the following two questions, chosen at random.

Option 1:

The boxplots below display annual incomes (in thousands of dollars) of households in two cities.



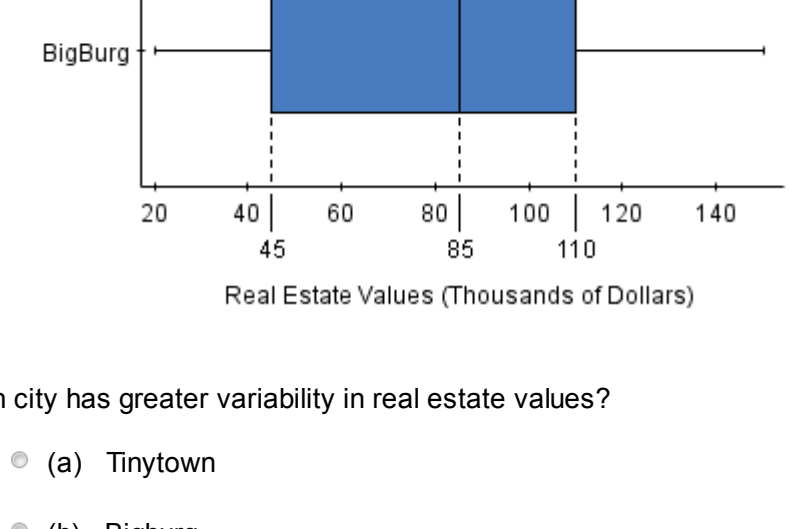
Which city has more households?

- (a) Statstown
- (b) Medianville
- (c) Both cities have the same number of households.
- (d) It is impossible to tell from the boxplots.

Correct answer: (d)

Option 2:

The boxplots below show the real estate values of single family homes in 2 neighboring cities (in thousands of dollars).



Which city has more households?

- (a) Tinytown
- (b) BigBurg
- (c) Both cities have the same number of households.
- (d) It is impossible to tell from the boxplots.

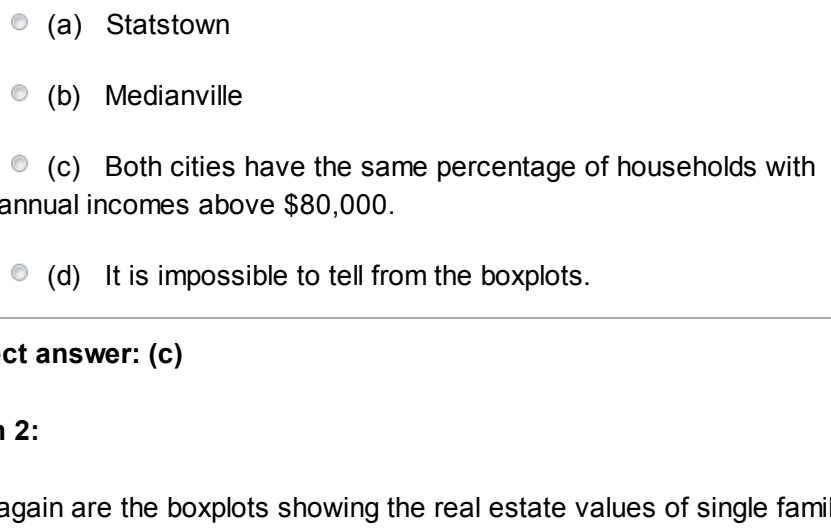
Correct answer: (d)

### Question 5

Students will see one of the following two questions, chosen to correspond with the scenario they saw in question 4.

Option 1:

Here again are the boxplots showing annual incomes (in thousands of dollars) of households in two cities.



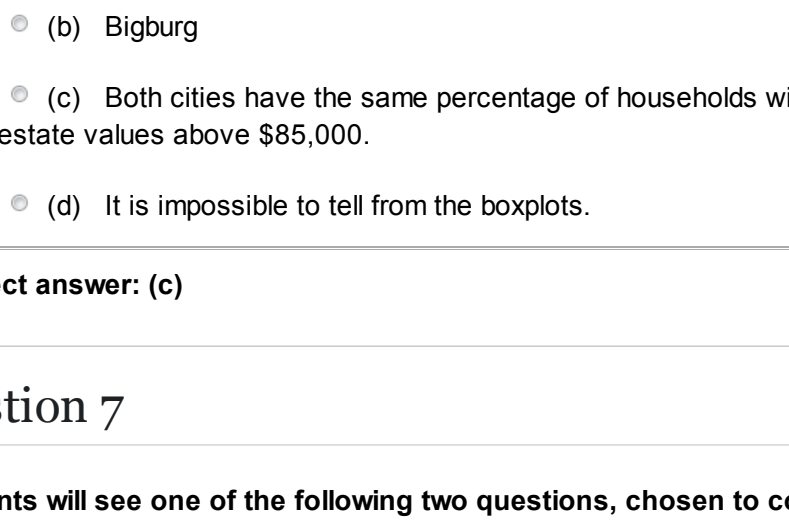
Which city has greater variability in income?

- (a) Statstown
- (b) Medianville
- (c) Both cities have the same variability in income.
- (d) It is impossible to tell from the boxplots.

Correct answer: (a)

Option 2:

Here again are the boxplots showing the real estate values of single family homes in 2 neighboring cities (in thousands of dollars).



Which city has greater variability in real estate values?

- (a) Tinytown
- (b) Bigburg
- (c) Both cities have the same variability in real estate values.
- (d) It is impossible to tell from the boxplots.

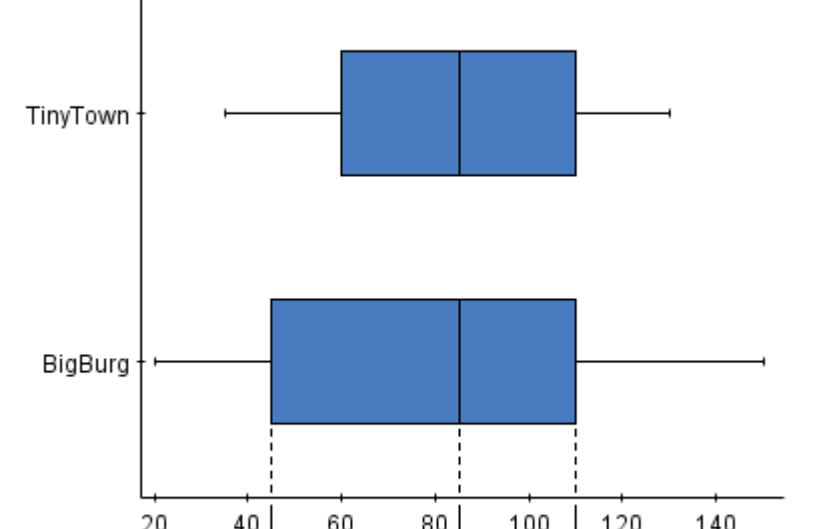
Correct answer: (b)

### Question 6

Students will see one of the following two questions, chosen to correspond with the scenario they saw in question 4.

Option 1:

Here again are the boxplots showing annual incomes (in thousands of dollars) of households in two cities.



Which city has a greater percentage of households with annual incomes above \$80,000?

- (a) Statstown
- (b) Medianville
- (c) Both cities have the same percentage of households with annual incomes above \$80,000.
- (d) It is impossible to tell from the boxplots.

Correct answer: (c)

Option 2:

Here again are the boxplots showing the real estate values of single family homes in 2 neighboring cities (in thousands of dollars).



Which city has the greater percentage of households with real estate values above \$85,000?

- (a) Tinytown
- (b) Bigburg
- (c) Both cities have the same percentage of homes with real estate values between \$55,000 and \$85,000.
- (d) It is impossible to tell from the boxplots.

Correct answer: (a)

Select one answer.  
10 points

Select one answer.  
10 points

Select one answer.  
10 points

Select one answer.  
10 points

Please answer the question below. Your response will not be graded, but will be available for your instructor to read.

### Question 8

What determines which numerical measures of center and spread are appropriate for describing a given distribution of a quantitative variable? Which measures will you use in each case?

0 points